Zero Retries issue 0044 2022-04-29

Technological innovation in Amateur Radio - Data Communications; Space; Microwave… the fun stuff! The Universal Purpose of Ham Radio is to have fun messing around with radios - Bob Witte K0NR. Ultimately, amateur radio must prove that it is useful for society - Dr. Karl Meinzer DJ4ZC. We are confronted by insurmountable opportunities! - Pogo. Nothing great has ever been accomplished without irrational exuberance - Tom Evslin. Irrational exuberance is pretty much the business model of Zero Retries Newsletter - Steve Stroh N8GNJ. What's life without whimsy? - Dr. Sheldon Cooper.

Zero Retries is a unique, quirky little highly independent, opinionated, self-published email newsletter about technological innovation in Amateur Radio, for a self-selecting niche audience, that's free (as in beer) to subscribe.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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Request To Send

Countdown to Hamvention 2022 - May 20-22, in Xenia, Ohio:
~~24~~ ~~23~~ ~~22~~ ~~21~~ ~~20~~ ~~19~~ ~~18~~ ~~17~~ ~~16~~ ~~15~~ ~~14~~ ~~13~~ ~~12~~ ~~11~~ ~~10~~ ~~09~~ ~~08~~ ~~07~~ ~~06~~ ~~05~~ ~~04~~ **03** weeks…

In 45 issues of Zero Retries, the subscriber count is now North of ***300***! Thank you for that vote of confidence, Zero Retries readers!

As I write this immediately prior to the active phase of packing for the big trip, and set it to autopublish, nothing significant comes to mind to editorialize upon. I hope to see at least some of you at Hamvention.

de Steve N8GNJ

Prep Work for Hamvention 2022

From the Hamvention website, here are some of the "indoor" vendors that I plan to visit at Hamvention:

- AMSAT-NA (Amateur Satellite Corp. North America)
    - I won't be satellite-capable in 2022, but I'll be making plans and gearing up.
- ARISS-USA (Amateur Radio on the International Space Station - USA)
    - As far as I'm concerned, ARISS is Amateur Radio's proudest boast (to date) in the 21st century.
- Airspy.US
    - One of my favorite vendors of Software Defined Receivers.
- ARDC (Amateur Radio Digital Communications)
    - I'll be meeting some of the ARDC team face to face for the first time.
- FlexRadio
    - When I get into HF seriously, it will be with a FlexRadio unit. Not to mention being alert for a face to face opportunity with Matt and / or Gerald Youngblood.
- Hobby PCB
    - I'm a fan of their RS-UV3A radio as a building block.
- Icom

    - I'm ~~hoping there might be some more info available about~~ looking forward to seeing at least the "prototype for the "SHF Project".
- NVIS / Codan Communications Consulting
    - US Representative of Codan Communications which makes some of the most impressive HF radio systems in the world.
- Phase Dock
    - Interesting approach to building one-off or prototype units.
- TAPR (Tucson Amateur Packet Radio)
    - They're at every Hamvention; checking in with some old friends and hopefully they'll be showing something interesting.
- West Mountain Radio
    - One of my favorite vendors for "Anderson Powerpole" 12 volt DC power distribution units.

All this said, with the exceptions of FlexRadio, Icom, and TAPR (hopefully), I don't see many "Zero Retries Interesting" vendors, but I've sometimes been surprised at Hamvention.

Zero Retries Interesting Forums

The Forums schedule is now posted! "Full details… coming soon". Here's some I'll attend if possible:

- Amateur Radio on the International Space Station (ARISS) - Frank Bauer KA3HDO.
- AMSAT - Phil Smith W1EME.
- Digital Modes - Mel Whitten K0PFX.
- HamSCI - Nathan Frizzell W2NAF.
- Homeland Security - John Peterson. The details on this one would be really interesting.
- Software Defined Radio - "Stephan" Hicks. I'm reasonably certain that should be *Stephen* Hicks N5AC, VP Engineering / CTO of FlexRadio.
- TAPR - Scotty Cowling WA2DFI.
- VHF-UHF-Microwave - Tony Emanuele K8ZR.

Notably absent:

- Amateur Radio Digital Communications. Investing ***$9M*** into Amateur Radio, scholarships, and Research and Development just in 2021 doesn't rate a dedicated speaking slot at Hamvention?
- APRS (unless TAPR will offer some of its forum time to discuss APRS).

Hamvention's 2022 flea market, of course, has an interesting-looking assemblage of vendors. For me, it's always a mental tug-of-war to attend "only at Hamvention" forums, or spend that same time period browsing the radio-fascinating "schtuff" in the Hamvention flea market.

Hamvention's flea market is easily equal, in my experience, to the superb flea markets in Silicon Valley and Swapfest - the Flea at MIT (Boston).

ARDC 2022 Q1 Grants Awarded

Disclaimer: I am a volunteer member of the ARDC 2022 Grants Advisory Committee. I don't speak for ARDC, and ARDC does not speak for me. All of the information mentioned here is public.

There have been some cool new ARDC grants awarded in the first quarter of 2022. Here are some that are Zero Retries Interesting awarded grants that are advancing technological innovation in Amateur Radio, and areas adjacent to Amateur Radio:

- DAEmod-915: Open-Source Open-Hardware 915MHz Digital Transceiver - developing a new open source radio design for Amateur Radio for 902-928 MHz.
- GNU Radio Usability Enhancements - I'm happy to see some attention paid to GNU Radio documentation and some new work on GNU Radio Companion (a grahpical user interface front end to GNU Radio).
- Wireless Regional Area Network in Sub-GHz Bands as Last Mile for HAMNET - This… is a big one. Hopefully this grant can help the RPX-100 - a software defined transceiver for 50 MHz, 144 MHz, and 420-450 MHz move beyond the prototype (?) stage and into a reproducible design that perhaps can be purchased by Amateur Radio Operators, as ELEKITSORPARTS did for another European data radio project - New Packet Radio.

It's a honor to work with the other members of the ARDC Grants Advisory Committee to channel ARDC funding into interesting projects such as these (and many more).

AX.25 Packet Survey

WW2BSA is posting this in a number of forums / mailing lists - this is just one.

Prof. Chris Lance WW2BSA - 2022-04-21:

> I am creating a user guide for new AX.25 packet radio operators that include current as well as legacy equipment. Since this is a Direwolf Group, it would be great to know what is working well - as well as not so well - with Direwolf and your station hardware. Can you please respond with the following information?
>
> - Computer (PC, MAC, Linux, RasPi)?
>   - 32-bit or 64-bit Operating System?
> - TNC or Soundcard?
>   - If TNC, type/version/etc (PK-232, Kantronics KPC-3+, Paccom, etc.)?
>   - If soundcard, motherboard or external?
>   - If external soundcard, type: Signalink, OpenModem, etc.
> - Software (PCPakratt, Putty, Winlink Express, Outpost, Direwolf, etc.?
> - Any other information you think will be helpful to a new ham on AX.25 packet.
>
> I will mention you name and call in the report unless you want to be anonymous. A copy of the report will emailed to all who participate.
>
> If you host a mailbox, node, BBS, Cluster, Packet to Paging Gateway, etc. and want to be listed in the Nationwide Amateur Radio Packet Directory Map, a volunteered labor of love, please let me know as well.
> 73 Sincerely, Prof. Chris Lance
> ww2bsa@arrl.net (publicly listed on his web page)

www.ww2bsa.org (redirects to http://hackettstownarts.org/ww2bsahome.htm which responds much faster).

ZR > BEACON

Lots of space'ish items this week (and room for them!)

- AMSAT-ZA is sponsoring a crowdsourced Satellite Manual Project:
  The biggest part of getting into this is always getting information. There are numerous sites around the internet where you can get various bits and pieces, but it can turn a bit into a rabbit hole. Because of this we decided to start the Satellite Manual Project. Its essentially documentation for getting into all aspects of amateur radio satellites. This will be an ongoing project, but the aim is to put all this information in one central point for easy reference.

- I wish I could remember how I found this - Multimedia High Speed Modem on the AMSAT-DL Satellite Wiki. *The multimedia high-speed modem is used for fast digital data transmission in a max. 2.7 kHz wide SSB channel. It was developed primarily for the QO-100 satellite, but can also be used on other bands.*
  Transfer Speed :
  When using an amateur radio transceiver: up to 6000 bit / s.
  When using SDR solutions (SDR console): up to 7200 bit / s

- Hyderabad Hams Develop Low Cost Transverter For QO-100 Satellite I've had a tickler about this news item rattling around for a long time and finally spent some time tracking down some substantive info. Unfortunately the linked article is light on technical details. Here's a bit more detail from the 2021-08-13 Amateur Radio Newsline Report:
  Two inventive amateurs in India have come up with a clever way to communicate with the QO-100 satellite. *Hams in Hyderabad have found a homebrew solution to make communication via the QO-100 satellite easier for other amateurs. They have designed prototype converters that will enable the hams to use the transponders on board the geosynchronous satellite. The prototypes include both up converters and down converters. Homebrewers Sasi Bhushan VU2XZ and A. Amarendra VU2AAP told the Telangana Today newspaper that the converters eliminate the need for such expensive equipment as software-defined radios. They said the system works in a way similar to a TV set-top box that receives programmes beamed from satellites, converting radio waves into signals for the TV. The circuit boards within the converter are designed to communicate via the 10 GHz frequency for downlink and the 2.4 GHz frequency for uplink. Sasi said the first hams to be given the opportunity to use the converters are members of the Lamakan Amateur Radio Club in Hyderabad. A transverter is also in the works, combining uplink and downlink capability.*

- In my (heavily biased, radio geek) opinion, the unsung technical hero of the Apollo space missions was the communications and telemetry capabilities. It's… just… heroic (more than amazing) what NASA and their primary communications contractor Motorola, was able to accomplish in maintaining communications between the Apollo and Moon spacecrafts. We're so much more capable now than we were 50 years ago, and thus it's amazing to look back at the space communications of that era that worked so well. In that vein, Ken Shirriff offers a great article - The digital ranging system that measured the distance to the Apollo spacecraft.

- Apparently NASA's Tracking and Data Relay Satellite System (TDRSS) is nearing the end of its lifetime. NASA is working to transition the role of TDRSS to commercial companies and it recently awarded $280M to SpaceX and others for development.

- Speaking of decommissioned satellites… **Are decommissioned satellites susceptible to hackers?** This is yet another Zero Retries Interesting mention that was surfaced by Southgate Amateur Radio News. This is a brief video interview from WKRC, a television station in Cincinnati, Ohio, and apparently this was one of the last interviews between WKRC anchor John Lomax and frequent guest Dave Hatter prior to Lomax's retirement. It's remarkable (to me) that a local television news program would dive into such a esoteric (to the public) tech story.
  Harken back to my mental experiment in Zero Retries 0012 - **Exploring the Idea of a Geostationary Amateur Radio Satellite for the Western Hemisphere**. Would the owners (and regulators, and…) prefer to have *hackers* with questionable intent going after their retired (but still functional, in "retirement" orbits) satellites? Or perhaps Amateur Radio Operators would be better "caretakers" of such retired satellites. The answer seems obvious to me, but I tend to take the long view, unlike the owners of such satellites.

- Proposal for a Spread Spectrum Transponder Payload On the International Space Station. This is a paper from the 1999 ARRL and TAPR Digital Communications Conference by Matt Ettus N2MJI (founder of Ettus Research). It's just another example of how Amateur Radio has been (trying to) advance technological innovation in Amateur Radio, but such big ideas are often stymied by very limited funding to even attempt the experiment. I'm glad that in the 2020s we now have ARDC grants available to perhaps now "attempt such experiments".

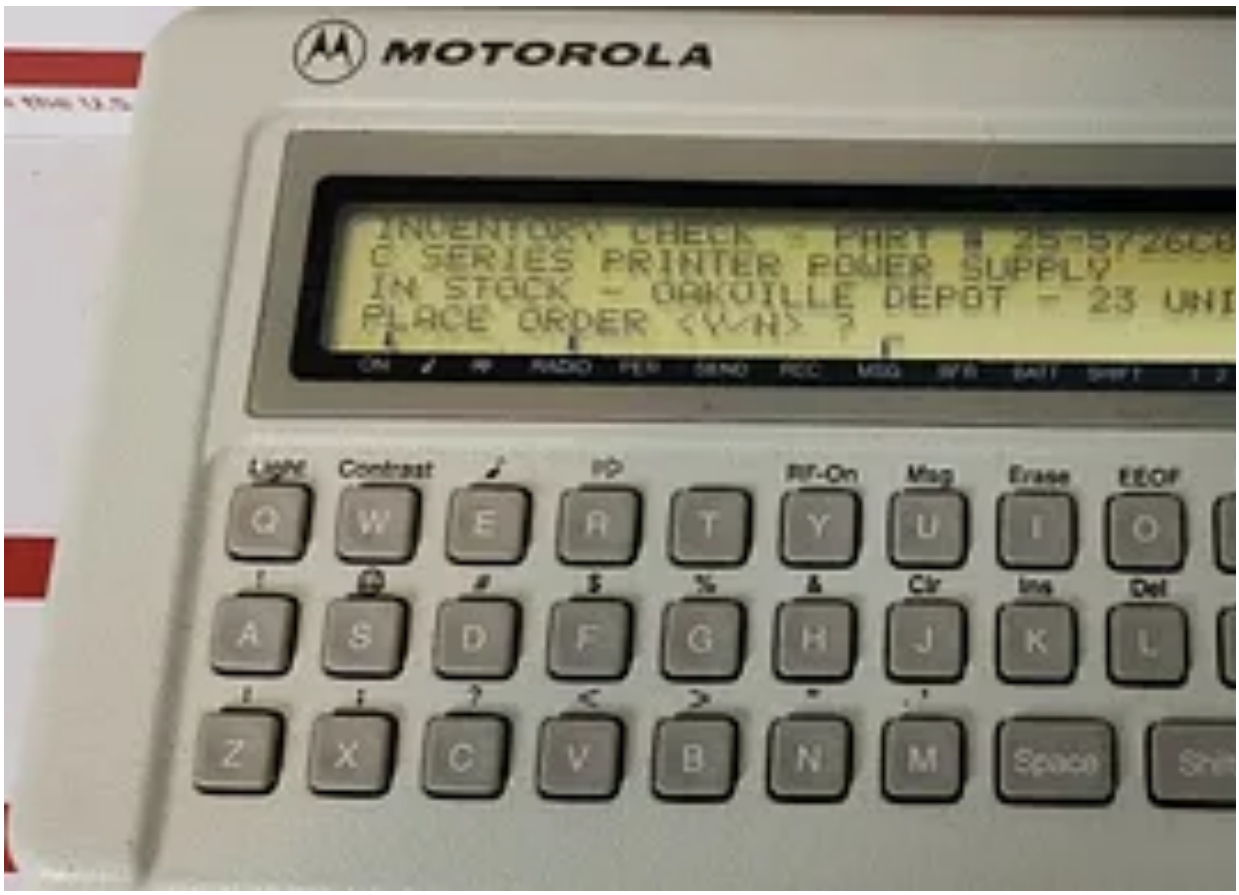
- **The British Amateur Television (BATV) Club** has posted a neat overview of a Amateur Television Repeater Controller based on a Raspberry Pi 4. ATV, and especially Digital Amateur Television is another Zero Retries Interesting that I think would be a heckuva lot of fun if you could put up a decent repeater. The article discussing controller is in their members-only (paywalled) magazine CQ-TV, issue 275.
  Longer term readers of Zero Retries know that I'm no fan of paywalls for Amateur Radio publications, but BATV is an exception. First, kudos to BATV for having an enlightened membership fee structure that distinguishes between the high costs of a paper newsletter, and the lower costs of an electronic newsletter. Second, kudos to BATV for making issues of CQ-TV older than two years available to the public. *That* is a reasonable compromise between the "public interest" of Amateur Radio, and wanting to provide some exclusivity to promote (paid) interest in club membership. I will seriously consider becoming an BATV member.

- Don't Cook Yourself With RF Energy is a very basic primer on working with Amateur Radios with reasonable power, and human proximity to antennas actually radiating significant radio frequency energy. My personal, basic rule - don't be within a few feet of an antenna that's radiating 25 watts or more of radio frequency energy, especially at 144 MHz and higher. Working around antennas and high power radio frequency energy used to be "poo-poo'ed" as no big deal… but now, we really do know better.

- W7FU Webpage - John Petrich W7FU is active in Software Defined Radio and microwave experimentation. Several years ago he created an SDR interest group within the MicroHAMS Amateur Radio Club in the Seattle, Washington area (unfortunately timed for me as I was making preparations to leave the Seattle area). John has documented his experimentation in SDR and SDR / Microwave experimentation on his website. I find W7FU's documentation to be quite approachable.

- The KE9V blog is no more. The link is the final "snapshot" from the Internet Archive's "Wayback Machine". As I said on Twitter, I will miss KE9V's (website / blog) perspective on life, the universe, and all things #hamradio. KE9V is unsentimental about such things, and I admire that "move ahead, dont' look back" perspective. Regrettably, that brings the Zero Retries pseudostaff down to one.

- In a recent tweet, I said "We need portable wireless data communications APPLIANCES! (For Amateur Radio)".



Motorola KDT840 Photo courtesy of eBay user "barringtonshop"

One of my mental role models for such a device was the predecessor of the Motorola KDT-840 handheld terminal that Motorola originally manufactured for IBM's field service personnel. It was handheld, battery powered, and wireless (on a dedicated nationwide network for IBM called ARDIS). I'm lucky enough to have a couple of these units in my collection. We need something like this for Amateur Radio data communications… at least *I* do. And, yes, the form factor of these devices lends themselves to being gutted and hacked with a radio module, batteries, and a Raspberry Pi Zero 2 W, but they're pretty rare so I plan to keep the ones I have intact. If I wasn't leaving on the big trip I would have bought the one in the photo.

- Raspberry Pi Production and supply-chain update by Eben Upton. Good news is that if you want a Raspberry Pi for a project, there's a good supply

of the Raspberry Pi 400s. Bad news is that there's no good news about Raspberry Pi single board computers (SBCs) and Raspberry Pi Compute Modules in the short term (unless you're a commercial user, in which case Raspberry Pi is prioritizing *your* needs). Long term, Raspberry Pi is working very hard to get more units into the retail (hobbyist, non-industrial) distribution channel. I suspect there's no other company / organization in the world as devoted to getting inexpensive computers out into the world as Raspberry Pi.

- GalliumOS is a replacement "regular Linux" for Chromebooks (laptops running Google's ChromeOS which is basically a "shell" OS and the "real work" is done by Google's cloud services). Chromebooks are attractive because they're relatively inexpensive as laptops go, but the ChromeOS "gets in the way" of many Amateur Radio functions. It's my guess that GalliumOS would make Chromebooks much more usable for Amateur Radio functions.

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
Join the Fun on Amateur Radio for some pointers.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with wireless technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to anyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*
- Pseudostaffer Dan Romanchik KB6NU for continuing to spot, and write about "Zero Retries Interesting" items on his blog that I don't spot on my own.
- Southgate Amateur Radio News consistently surfaces "Zero Retries Interesting" stories.
- The Substack email publishing platform makes Zero Retries possible. I recommend it for publishing newsletters.

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More bits from Steve Stroh N8GNJ:

- SuperPacket blog - *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog - *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs - Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted in beautiful Bellingham, Washington, USA
2022-04-29

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